

WHAT IS CLAIMED IS:

1 1. A method for improving performance by increasing available bandwidth in a network
2 system that includes one or more requestor nodes, one or more provider nodes and one or
3 more intermediate nodes, the method comprising:

4 determining a digital signature of a requested file stored by at least one provider node
5 in the network system;

6 looking up the digital signature in an index of signatures; and

7 forwarding a previously compressed version of the requested file that has been stored
8 at an intermediate node when the digital signature is found in the index of signatures.

1 2. The method of claim 1 further comprising compressing the requested file and storing
2 the digital signature in the index of signatures when the digital signature is not found in the
3 index of signatures.

4 3. The method of claim 2 further comprising sending the compressed version of the
5 requested file to a requestor node.

1 4. The method in claim 2 further comprising sending the compressed version of the
2 requested file to a requestor node and storing the compressed version of the requested file at
3 the intermediate node.

1 5. The method of claim 1 wherein determining the digital signature comprises applying
2 a hashing technique to the requested file.

1 6. The method of claim 5 wherein applying the hashing technique comprises applying a
2 version of the MD5 algorithm to the requested file.

1 7. The method of claim 5 wherein applying the hashing technique comprises applying a
2 version of the SHA algorithm to the requested file.

1 8. The method of claim 1 further comprising determining whether an estimated time
2 required to directly provide the requested file to a requestor node is less than an estimated

time to determine if a previously compressed version of the requested file is already stored at the intermediate node.

9. The method of claim 2 wherein determining the digital signature includes determining the digital signature at the provider node.

10. The method of claim 9 wherein looking up the digital signature includes looking up the digital signature at the provider node.

11. The method of claim 9 wherein looking up the digital signature includes looking up the digital signature at the intermediate node.

12. The method of claim 1 wherein determining the digital signature includes determining the digital at the intermediate node.

13. The method of claim 12 wherein looking up the digital signature includes looking up the digital signature at the provider node.

14. The method of claim 12 wherein looking up the digital signature includes looking up the digital signature at the intermediate node.

15. The method of claim 12 wherein the intermediate node comprises a caching server.

16. The method of claim 1 wherein looking up the digital signature includes looking up the digital signature at the provider node.

17. The method of claim 1 wherein looking up the digital signature is performed at the intermediate node.

18. The method of claim 1 further comprising receiving the index of digital signatures from a provider node.

1 19. The method of claim 1 further comprising receiving the index of digital signatures
2 from an intermediate node.

1 20. The method of claim 1 wherein determining the digital signature is performed at the
2 provider node.

1 21. The method of claim 1 wherein determining the digital signature is performed at the
2 intermediate node.

1 22. An apparatus for improving the performance of a network system by increasing
2 available bandwidth, the apparatus being configured to:

3 determine a digital signature of a requested file stored by at least one provider node in
4 the network system;

5 look up the digital signature in an index of signatures; and

6 forward a previously compressed version of the requested file that has been stored at
7 an intermediate node when the digital signature is found in the index of signatures.

1 23. The apparatus of claim 22 wherein the apparatus is further configured to compress the
2 requested file and store the digital signature in the index of signatures when the digital
3 signature is not found in the index of signatures.

1 24. The apparatus of claim 23 further comprising an output interface for sending the
2 previously compressed version of the requested file to a requestor node.

1 25. The apparatus of claim 22 wherein the apparatus comprises a provider node.

1 26. The apparatus of claim 22 wherein the apparatus comprises an intermediate node.

1 27. The apparatus of claim 26 wherein the apparatus comprises a proxy server.

1 28. The apparatus of claim 26 wherein the apparatus comprises an IP tunnel.

